Ontario Water Resources Commission
Divsion of Plant Operations.

1971 OPERATING SUMMARY

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TRENTON

WATER POLLUTION CONTROL PLANT

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Water management in Ontario

Ontario
Water Resources
Commission

We are pleased to submit for your consideration a summary of operation during 1971 of the water pollution control plant serving your community.

This operating summary contains parameters normally used to measure plant performance and loading, as well as relevant cost data. Because of the concern over eutrophication of our lakes and of the requirement, in many parts of Ontario, to remove the major contributing factor, results of analysis for phosphorus appear in this summary.

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TRENTON

WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF TRENTON

by the

ONTARIO WATER RESOURCES COMMISSION

1971 ANNUAL OPERATING SUMMARY

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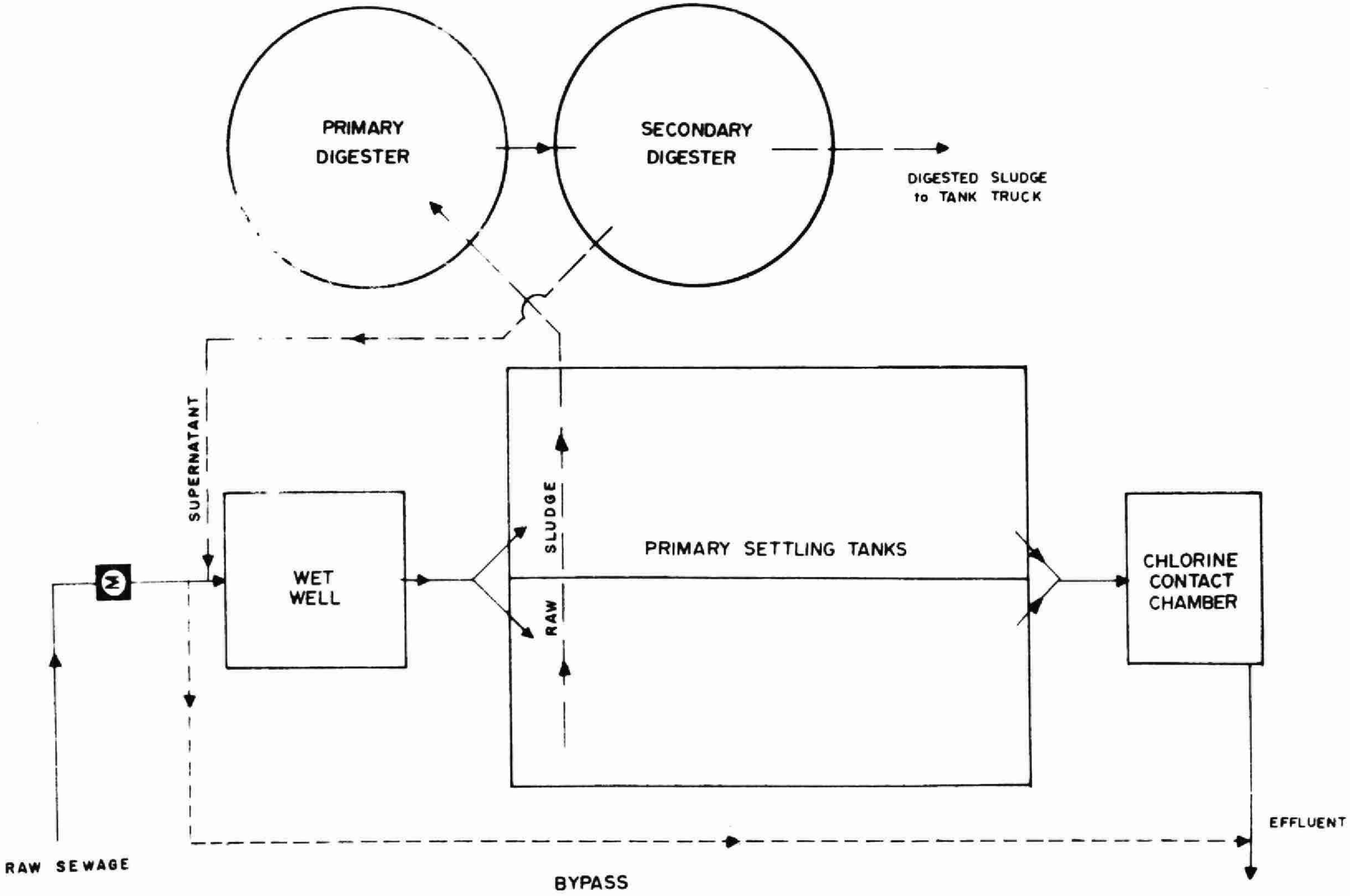
TRENTON
WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO.		2-0004-57
TREATMENT		Primary
DESIGN FLOW		1.0 mgd
DESIGN POPULATION		12,000
BOD	- Raw Sewage	250 mg/l
	- Removal	35%
SS	- Raw Sewage	200 mg/l
	- Removal	55%

PRIMARY TREATMENT

Grit Removal

Type: Aerated, with air lift
Size: One 10' x 9' x $8\frac{1}{2}$' (4,775 gal)
Retention: 1.5 min

Primary Sedimentation

Type: Jeffrey
Size: Two 52' x 16' x 12' (125,000 gal)
Retention: 3.0 hr
Loading: Surface, 600 gal/ft^2/day
Weir, 8340 gal/ft/day

Air Supply

Two Roots-Connersville

CHLORINATION

Type: F & P

Chlorine Contact Chamber

- not provided; chlorination in outfall

OUTFALL

- 850 ft of 30" concrete pipe to Bay of Quinte

SLUDGE HANDLING

Digestion System - Two-stage

Primary --
Type: Gas mixed, fixed cover; PFT
Size: One 28' dia x 23' (13,500 cu ft or 84,000 gal)
Loading: 2.62 lb/cu ft/mo

Secondary --
Type: Fixed cover
Size: One 28' dia x 23' (13,500 cu ft or 84,000 gal)
Total Loading: 1.31 lb/cu ft/mo

PUMPING STATIONS

Dundas Street Pumping Station

Type: Fairbanks-Morse
Size: One 700 gpm @ 39' tdh
One 1740 gpm @ 48' tdh
One 3130 gpm @ 68' tdh (diesel)

'71 Review

GENERAL

The Trenton Water Pollution Control project consists of a 1.0 mgd primary treatment plant, two pumping stations and associated forcemains and sewers.

During 1971, the roofs on both the primary and secondary digesters were replaced as well as the flashing and insulation. The original roofing material had severely deteriorated. Major parts were replaced in the raw sludge and sludge transfer pumps as well as the gas compressor.

Some of the gas piping to the boiler was replaced during the year. Standby lights were installed at the plant and all pumping stations, and a new high capacity sump pump was installed at the Dundas Street pumping station to prevent dry well floodings.

EXPENDITURES

The total operating expenditures for the plant and associated pumping stations was $38, 872.83 which was within the estimated operating budget of $39, 360.00. The cost of treating 1 million gallons of sewage was $49.83 or approximately 4.3 cents per pound of BOD removed.

PLANT FLOWS and CHLORINATION

A total of 780 million gallons of sewage was treated in 1971. The average daily flow of 2.15 mgd exceeded the design capacity of the plant 100 percent of the time. The overloaded condition was due to increased development and a general increase in the serviced area contributing to the treatment facilities. The pumping stations and treatment plant facilities were all severely overloaded during rain storms and spring runoff periods.

Chlorination of the final effluent is practiced on a year round basis as directed by the Division of Sanitary Engineering. The total amount of chlorine used to disinfect the effluent was 35,300 pounds. A satisfactory chlorine residual was difficult to achieve because of the limitations of the equipment and inadequate detention of the effluent in the absence of a chlorine retention tank.

SLUDGE DIGESTION and DISPOSAL

A total of 361 cubic yards of sludge with an average solids content of 8.6 percent was hauled during the year.

PLANT EFFICIENCY

The average concentrations of BOD and suspended solids in the plant influent were 283 and 167 mg/l respectively. The average concentrations of BOD and suspended solids in the plant effluent were 165 and 87 mg/l respectively. This represented a reduction in BOD and suspended solids of 42 and 48 percent respectively. This degree of treatment was satisfactory considering the overloaded condition of the plant.

CONCLUSIONS

The treatment plant and Dundas Street pumping station were hydraulically overloaded. It is expected that the final design for the expansion of these facilities will be completed in 1972.

PROJECT COSTS

2-0004-57

NET CAPITAL COST (Final)	$515,665.11
DEDUCT - Portion financed by CMHC/MDLB (Final)	-
Long Term Debt to OWRC	$515,665.11
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	$172,515.47

Net Operating	$ 41,694.83
Debt Retirement	3,840.00
Reserve	1,456.44
Interest Charged	28,924.08
TOTAL	$ 75,915.35

RESERVE ACCOUNT

Balance @ January 1, 1971	$ 33,913.23
Deposited by Municipality	1,456.44
Interest Earned	2,242.75
	$ 37,612.42
Less Expenditures	-
Balance @ December 31, 1971	$ 37,612.42

PROJECT COSTS

2-0225-67

NET CAPITAL COST (Final)	$374,507.66
DEDUCT - Portion financed by CMHC/MDLB (Final)	211,190.80
Long Term Debt to OWRC	$163,316.86

Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	$ 8,153.90

Net Operating	$ -
Debt Retirement	2,255.00
Reserve	1,784.80
Interest Charged	12,531.41
TOTAL	$ 16,571.21

RESERVE ACCOUNT

Balance @ January 1, 1971	$ 3,136.42
Deposited by Municipality	1,784.80
Interest Earned	242.39
	$ 5,163.61
Less Expenditures	-
Balance @ December 31, 1971	$ 5,163.61

PROJECT COSTS

2-0095-61 NET CAPITAL COST (Final)	$191,666.59
DEDUCT - Portion financed by CMHC/MDLB (Final)	133,905.12
Long Term Debt to OWRC	$ 57,761.47
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	$ 13,575.12
Net Operating	$ -
Debt Retirement	578.00
Reserve	667.26
Interest Charged	3,239.88
TOTAL	$ 4,485.14

RESERVE ACCOUNT

Balance @ January 1, 1971	$ 11,185.48
Deposited by Municipality	667.26
Interest Earned	744.10
	$ 12,595.84
Less Expenditures	-
Balance @ December 31, 1971	$ 12,595.84

PROJECT COSTS

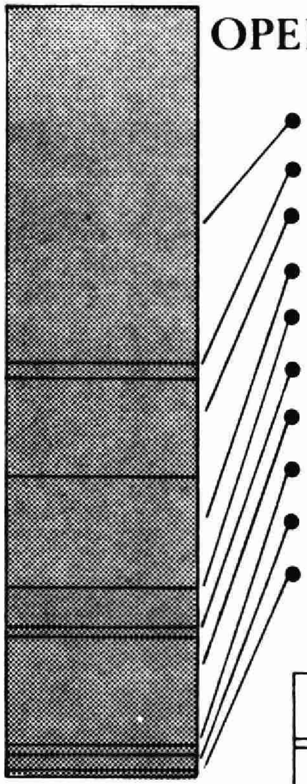
2-0272-69 NET CAPITAL COST (Final)	$119,572.01
DEDUCT - Portion financed by CMHC/MDLB (Final)	91,417.00
Long Term Debt to OWRC	$ 28,155.01
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	$ Nil
Net Operating	$ Nil
Debt Retirement	"
Reserve	"
Interest Charged	"
TOTAL	$ Nil

RESERVE ACCOUNT

Balance @ January 1, 1971	$ Nil
Deposited by Municipality	
Interest Earned	
Less Expenditures	$ Nil
Balance @ December 31, 1971	$ Nil

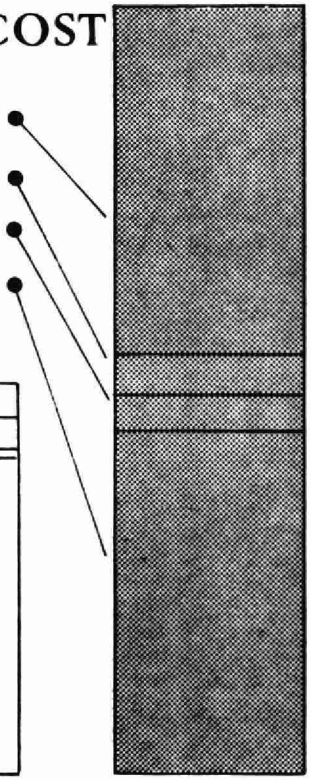
1971 COSTS

OPERATING COSTS



PAYROLL	49 %
FUEL	2 %
POWER	12 %
CHEMICALS	14 %
GENERAL SUPPLIES	5 %
EQUIPMENT	1 %
REPAIRS & MAINTENANCE	14 %
SUNDRY	1 %
WATER	2 %
TRAVEL	< 1 %

TOTAL ANNUAL COST



NET OPERATING	43 %
DEBT RETIREMENT	7 %
RESERVE	5 %
INTEREST	45 %

YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	TREATMENT COSTS	
			$ per million gal	¢ per lb BOD
1967	405.32	$22,513.09	$55.55	3 cents
1968	466.88	26,431.57	56.61	4 cents
1969	401.70	28,799.25	36.84	5 cents
1970	606.9 (est)	40,728.10	66.00	8 cents
1971	780 (est)	41,694.83	53.45	5 cents

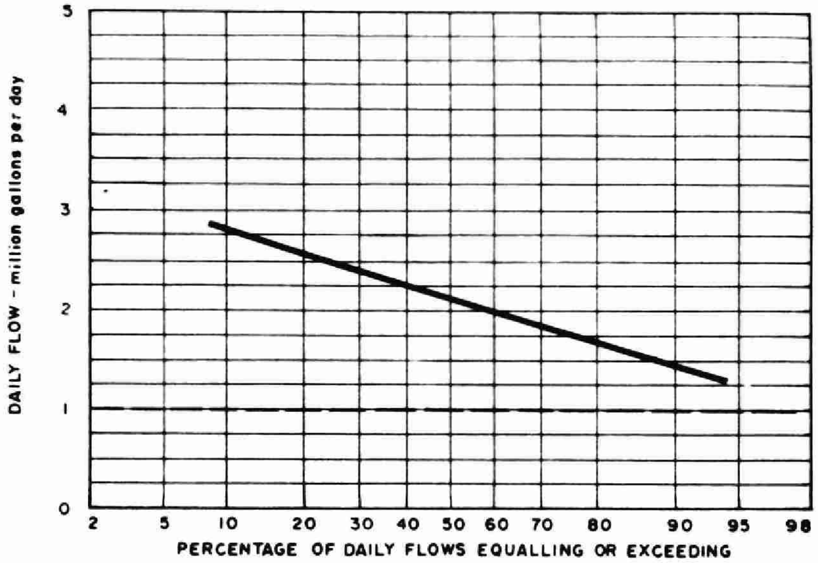
MONTHLY OPERATING COSTS

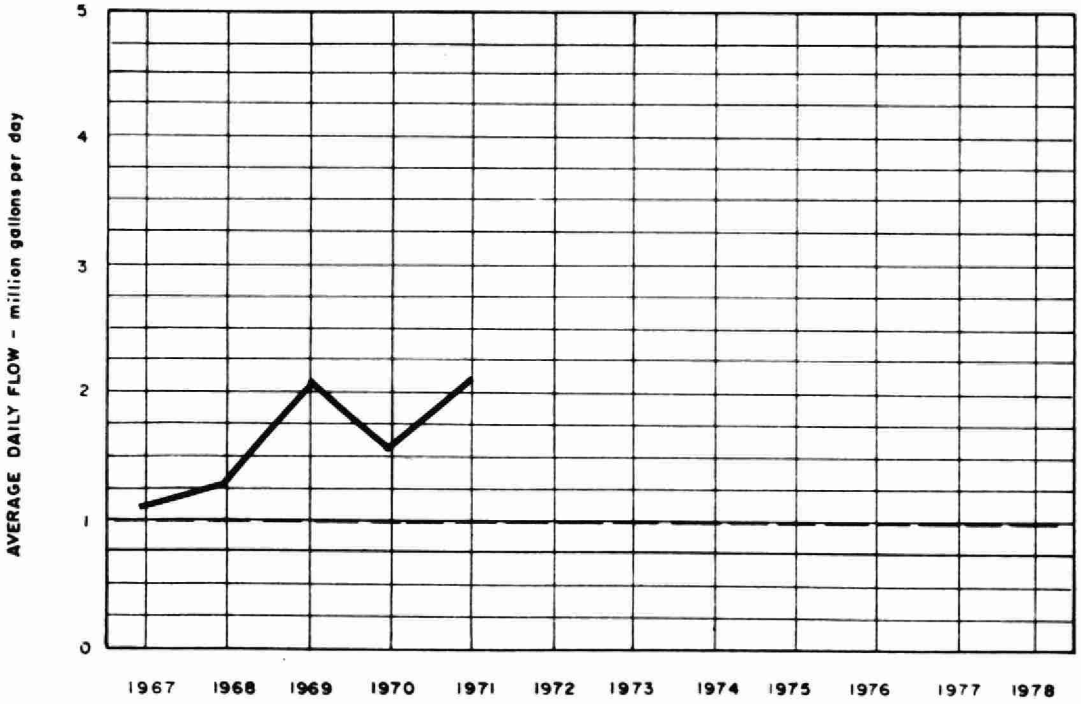
MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY*	WATER	TRAVEL
JAN	2574.47	1754.14	-	81.98	-	581.18	101.83	-	55.34	-	-	-
FEB	4180.01	2498.53	-	89.46	453.07	-	105.86	420.00	476.99	31.78	33.97	70.35
MAR	1682.98	209.50	-	51.07	473.78	581.18	120.68	-	154.21	52.45	40.11	-
APR	2778.31	1652.37	-	60.53	441.04	-	266.22	-	263.95	67.79	22.06	4.35
MAY	2546.18	1052.29	154.89	56.58	474.34	568.50	122.29	-	-	12.23	105.06	-
JUNE	4298.04	2271.11	(154.89)	58.22	387.48	568.50	196.97	318.09	498.21	97.03	57.32	-
JULY	3235.69	1163.66	-	58.56	371.81	427.12	302.51	-	773.49	76.60	61.94	-
AUG	4769.86	1367.08	90.00	69.56	334.73	113.70	-	(391.50)	3111.00	1.83	73.46	-
SEPT	4695.78	1845.05	359.28	40.95	334.60	1137.03	149.40	-	-	770.22	59.25	-
OCT	3625.48	2372.98	-	31.97	385.99	568.50	107.55	32.13	50.00	-	76.36	-
NOV	4111.86	2847.81	-	39.85	362.79	800.75	312.52	125.00	107.09	(670.26)	70.83	115.48
DEC	3196.17	840.73	-	87.48	873.52	568.50	153.10	36.75	396.50	98.91	140.68	-
TOTAL	41694.83	19875.25	449.28	726.21	4893.15	5914.96	1938.93	540.47	5886.78	538.58	741.04	190.18

Brackets indicate credit.

PROCESS DATA

FLOWS





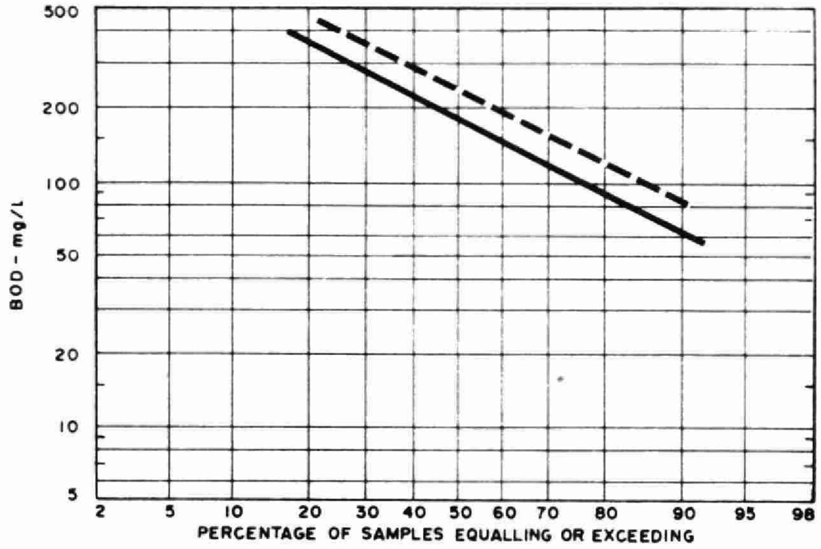
DESIGN CAPACITY - - - - - - - -

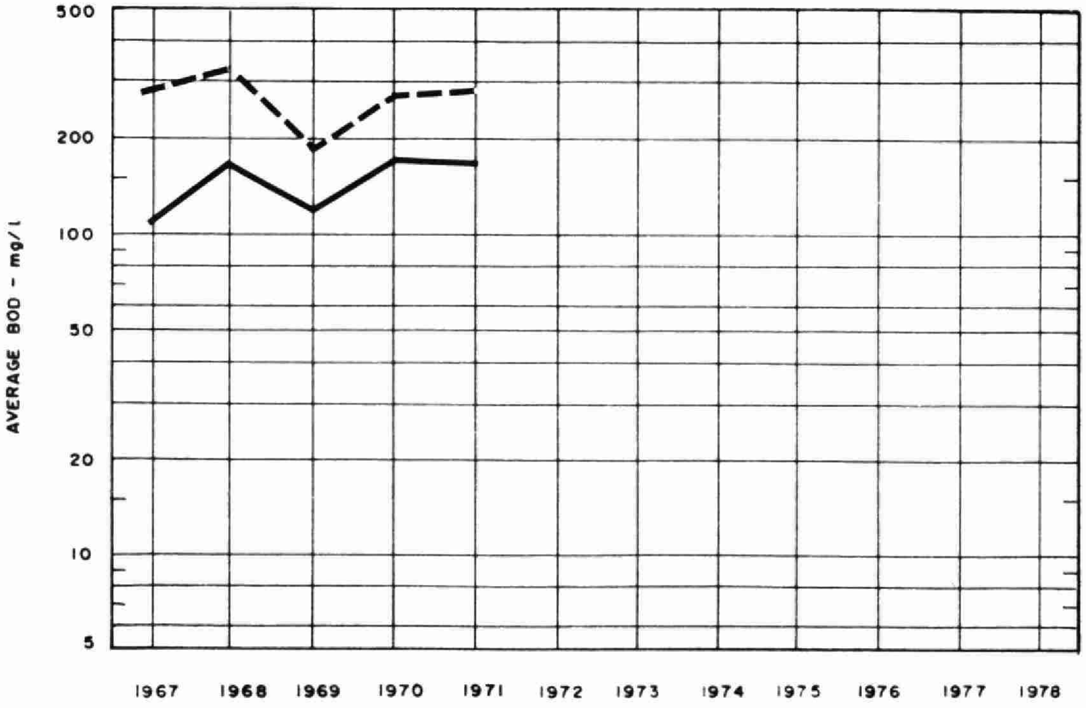
PLANT PERFORMANCE

MONTH	FLOWS				BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				TOTAL PHOSPHORUS		
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	MAXIMUM RATE	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDn
	million gallons	mil gal	mil gal	mgd	mg/l	mg/l	%	10^3 pounds	mg/l	mg/l	%	10^3 pounds	mg/l as P	mg/l as P	%
JAN	40 a	1.91	4.6	4.5	320	290	9	18	255	130	49	74	7.4	8.1	0
FEB	57 b	2.28	4.0	6.0	280	165	41	58	225	120	47	54	11.2	5.9	47
MAR	6 c	3.00	3.4	5.8	185	69	63	109	80	57	29	40	4.6	5.1	0
APR	31 d	3.46	3.7	5.5	55	26	53	30	35	30	14	5	1.6	4.7	0
MAY	72 e	2.48	3.8	5.1	60	49	18	8	60	40	33	15	4.5	5.0	0
JUNE	66	2.20	2.5	5.0	460	300	35	106	160	130	19	20	15.0	8.3	45
JULY	65	2.09	3.9	5.0	420	200	52	143	300	90	70	137	8.0	7.5	6
AUG	55	1.77	5.0	3.4	-	-	-	-	-	-	-	-	-	-	-
SEPT	60	2.00	3.4	5.5	-	-	-	-	-	-	-	-	-	-	-
OCT	63	2.13	2.9	4.9	380	34	91	218	110	60	91	32	3.8	6.8	0
NOV	56	1.93	2.2	5.0	500	110	78	218	230	90	61	79	12.0	11.0	8
DEC	71	2.30	3.2	5.0	240	380	0	0	150	80	47	50	14.0	26.0	0
TOTAL	780 est.	-	-	-	-	-	-		-	-	-		-	-	-
AVG.	-	2.15	MAXIMUM 4.6	MAXIMUM 6.0	283	165	42	91	167	87	48	58	8.2	8.8	0
No. of Samples	-	-	-	-	13	13	-	-	13	13	-	-	14	14	-

a - 21 days' flow data
b - 25 days' flow data
c - 2 days' flow data
d - 9 days' flow data
e - 29 day's flow data

BIOCHEMICAL OXYGEN DEMAND

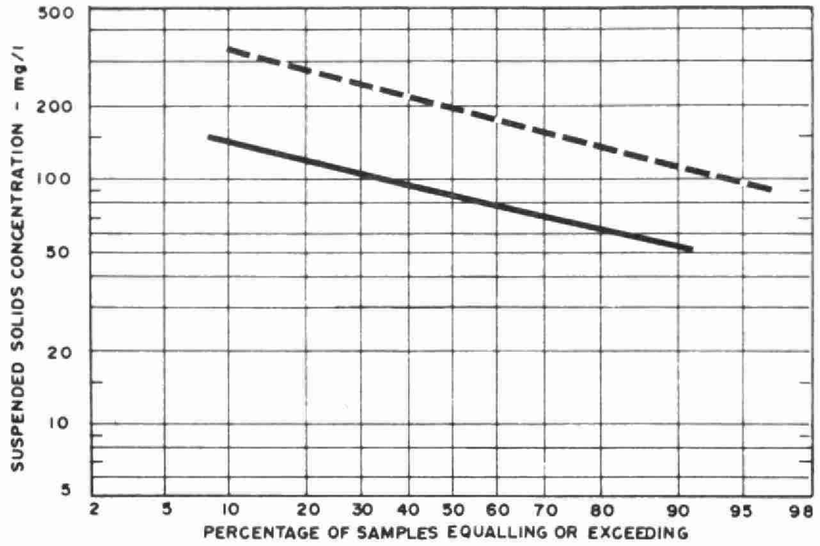


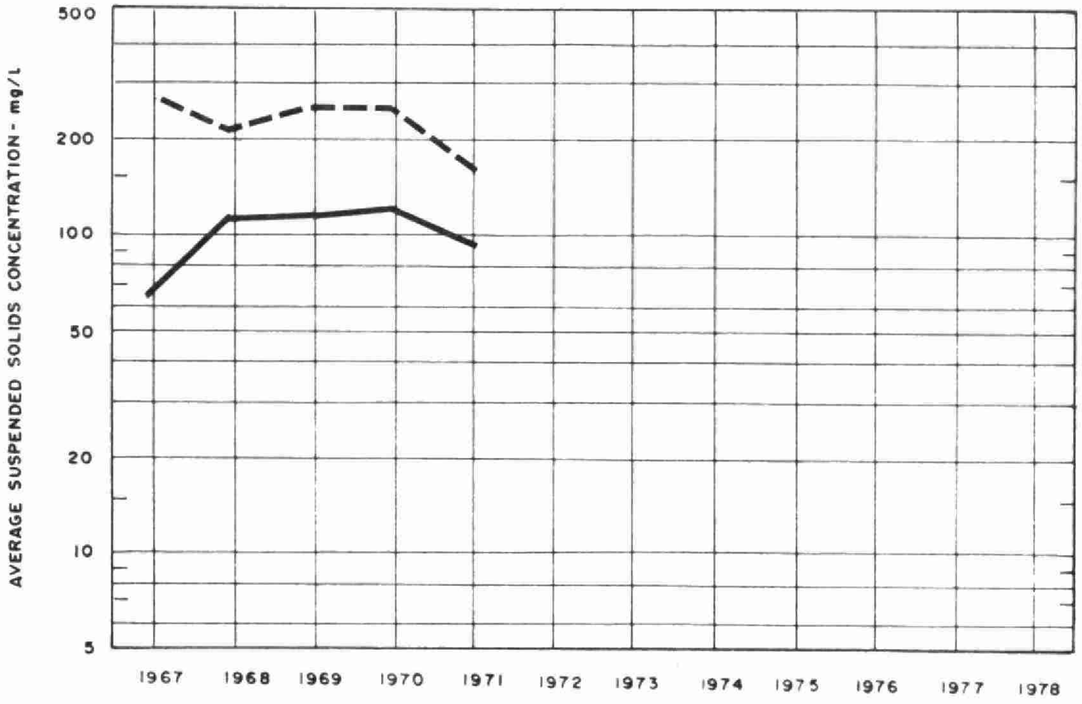


PLANT INFLUENT - - - - - - -

PLANT EFFLUENT ———————

SUSPENDED SOLIDS





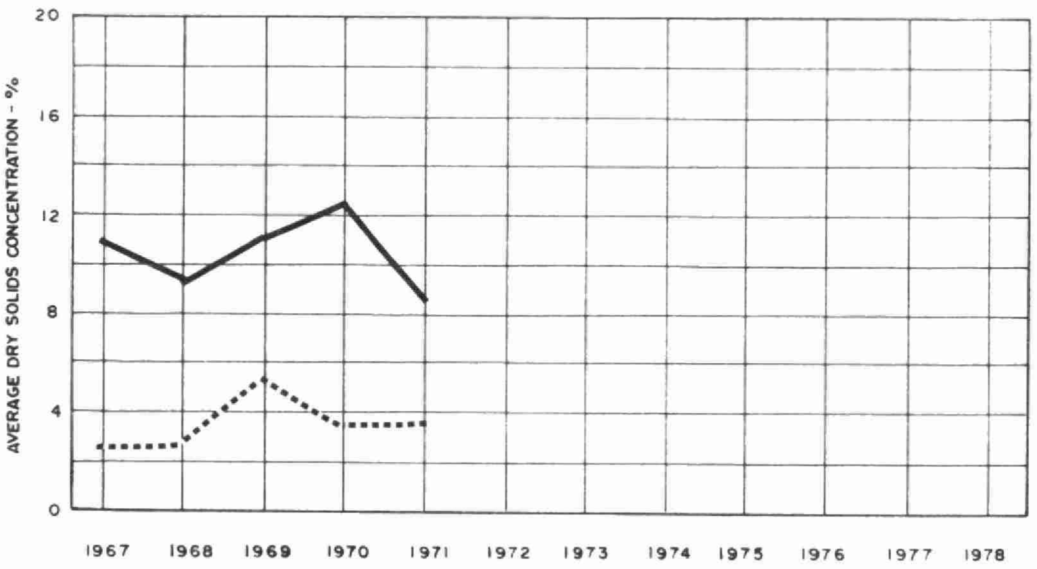
PLANT INFLUENT - - - - - - -

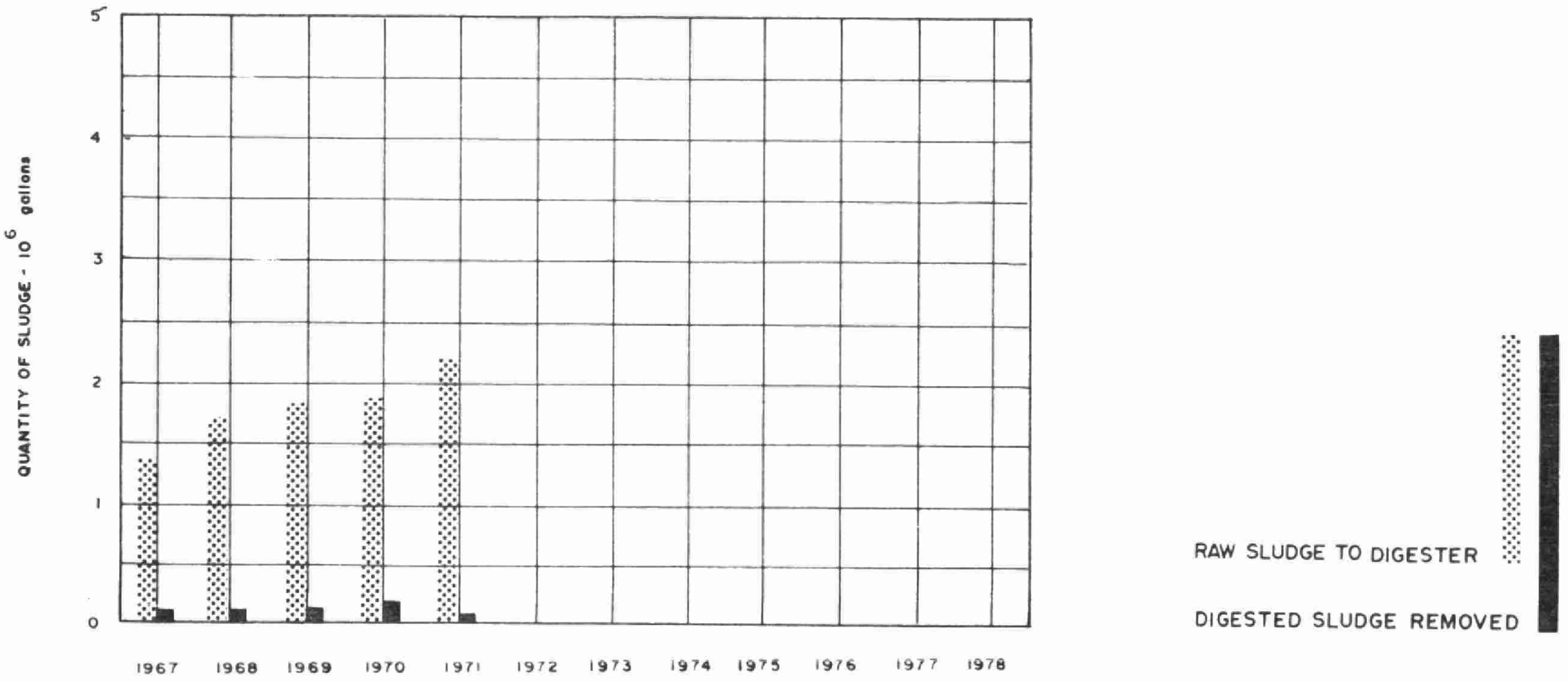
PLANT EFFLUENT ———————

TREATMENT DATA

	GRIT	CHLORINATION		SLUDGE DIGESTION and DISPOSAL							
				RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT	
MONTH	QUANTITY REMOVED cubic feet	CHLORINE USED 10^3 pounds	AVERAGE DOSAGE mg/l	QUANTITY 10^5 gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	QUANTITY REMOVED 10^3 gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	TOTAL SOLIDS %	SLUDGE HAULED cubic yards
JAN	0	2.1	5.6	1.9	2.8	-	0	13.1	-	3.0	0
FEB	0	.6	6.1	1.7	7.0	36	0	12.6	-	2.8	0
MAR	20	3.7	4.1	1.9	.6	-	0	6.8	-	.8	0
APR	5	3.3	3.2	1.9	.6	-	22.9	1.2	-	.8	136
MAY	4	2.8	3.7	1.9	4.5	-	9.1	3.8	-	.3	54
JUNE	0	3.2	4.8	1.8	1.8	-	0	6.8	-	.4	0
JULY	0	3.2	5.0	1.9	3.6	-	0	18.5	-	-	0
AUG	0	3.0	5.5	1.9	-	-	17.2	-	-	-	102
SEPT	0	3.1	5.1	1.9	-	-	0	-	-	-	0
OCT	70	3.7	5.8	2.1	3.8	-	11.6	7.1	-	2.7	69
NOV	20	3.1	5.6	2.0	4.1	-	0	-	-	-	0
DEC	0	3.5	5.0	2.0	4.8	-	0	7.1	-	1.0	0
TOTAL	119	35.3	—	22.9	—	—	60.8	—	—	—	361
AVG.	.15 cubic feet/mil gal	2.9	4.5	1.9	3.4	36	5.0	8.6	-	1.5	30

DIGESTION


RAW SLUDGE ••••••••••••••
DIGESTED SLUDGE ▬▬▬
AVERAGE DRY SOLIDS CONCENTRATION - %
20
16
12
8
4
0
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978


QUANTITY OF SLUDGE - 10^6 gallons
5
4
3
2
1
0
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
RAW SLUDGE TO DIGESTER ▨
DIGESTED SLUDGE REMOVED ■

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